REMARKS

Claims 1-25 are pending in the application.

Claims 1-25 have been rejected.

Claims 1, 6, 10, and 18-22 have been amended. No new matter is added. Support for these amendments can be found at least on paragraph 100 of the specification.

Claims 13-17 have been cancelled.

Double Patenting

Claims 1 and 7-10 of this application conflict with claims 1-2, 7-10, 13, 18, and 23 of Application No. 10/728,027. Applicants herewith submit a Terminal Disclaimer to overcome this rejection.

Rejection of Claims under 35 U.S.C. § 101

Claims 10-22 are rejected under 35 U.S.C. § 101 because the claimed invention is purportedly directed to non-statutory subject matter.

The Examiner states that claims 10-17 are not being statutory because these claims are said to reasonably be interpreted to be software and as such are not patent eligible subject matter." As for claims 10-12, Applicants submit that claims 10-12 are means plus function claims, which are inherently statutory since they are directed to apparati (means) for performing functions of the system, under 35 U.S.C. § 112, paragraph 6. Thus, Applicants respectfully submit that claims 10-12 recite patentable subject matter.

As to claims 15-18, Applicants have cancelled claims 13-17, thus, Applicants respectfully submit that the rejection of claims 13-17 is therefore rendered moot.

The Office Action rejected claims 19-22 because the computer readable medium of claims 19-22 include carrier waves and thus are not patentable. (Office Action p. 4). As shown in the above listing of claims, Applicants have amended independent claim 18 to include a limitation directed toward "A computer-readable storage medium having a plurality of instructions embodied therein, wherein said plurality of instructions are executable for..." See, e.g., claim 18 (amended). Applicants respectfully submit that the claimed computer readable storage medium is statutory within the context of 35 U.S.C. §101, and that the rejection is therefore rendered moot. For at least these reasons, Applicants submit that claims 10-22, as amended, are in condition for allowance. Applicants therefore respectfully request the Examiner's reconsideration and withdrawal of the rejections as to these claims and an indication of the allowability of same.

Rejection of Claims under 35 U.S.C. § 103

Claims 1-26 stand rejected under 35 U.S.C. § 103(a) as being purportedly anticipated over Gabber et al., U.S. Publication No. 2003-0145179 (Gabber) in view of Duprey et al., U.S. Patent No. 6, 671,705 (Duprey). Applicants respectfully traverse this rejection.

This rejection relies on Gabber and Duprey in rejecting claim 1. While not conceding that Gabber and Duprey are prior arts, but instead to expedite prosecution, Applicants have chosen to overcome this rejection by amendment.

Gabber and Duprey, alone or in combination fail to teach or suggest a method comprising:

identifying a plurality of secondary nodes, wherein

the identifying comprises sending data update to the plurality of secondary nodes,

at least one secondary node of the plurality of secondary nodes inserts the update in a respective log of updates, and each of the respective log of updates corresponds to a respective copy of the data; and

sending a notification to each of the plurality of secondary nodes once all of the plurality of secondary nodes have acknowledged the update

as required by independent claim 1, and generally required by independent claims 10, 18, and 23.

As correctly noted in the Office Action, Gabber fails to show, teach or suggest the claimed "...secondary node inserting an update in a respective log..." and "sending notification associated with the log..." limitations of claim 1. Gabber fails to show, teach or suggest these limitations of claim 1 because under Gabber's regime, when a storage element and its associated storage device are out of synch, Gabber teaches direct recovery by transferring data between data storage element and its associated storage device. A log is not only unused in this operation but it is in fact, unnecessary. It is therefore not surprising that Gabber does not show, teach or suggest that the use of a log.

Regarding Gabber's operation of "identifying a plurality of secondary nodes..." operation, the Examiner refers to Gabber's "Fig. 2: Item 203, system identifies storage elements" but provides no further guidance. Reference character 203 as illustrated in Figure 2 refers to locating a storage element to which a request is to be sent. Paragraph 23, lines 3-5 of Gabber state:

> At step 203, a determination is made whether there is at least one storage element 102 to which to send the **request**. If not, at step 204, a negative response is sent back to the host computer 103. (Gabber paragraph 23, lines 3-5)(Emphasis added)

Figure 2 is a flowchart illustrating the steps that a host element performs in processing a request originating from a host computer. The cited portion of Gabber recites sending the request to at least one storage element. Claim 1 mandates sending an update to the identified plurality of secondary nodes. Gabber defines a request as a read request or a write request. (Gabber, Paragraph 16, lines 23-24). Thus, Gerber teaches sending a read or a write request to at least one storage element. Gabber does not teach request to be an update. Thus, the reference character 203 fails to teach sending an update to data limitation of claim 1.

Furthermore, Gabber's request is not analogous to the claimed update. Gabber teaches sending a read or a write request which is merely a request to perform a read or a write operation on data to at least one storage element. In contrast, claim 1 mandates sending an update to the plurality of secondary nodes. The claimed update refers to data modification resulting from an operation performed on data. (Specification, paragraph 51, lines 2-3) Clearly, an operation is not analogous to the resulting data transformation effectuated by the operation. Thus, Gabber's read or write request (a request to perform the operation) is not analogous to the claimed update (the operation itself).

Claim 1 recites sending an update to the plurality of secondary nodes. In contrast, Gabber describes sending write requests to all of the storage elements. The claimed plurality of secondary nodes is a subset of the secondary nodes. Thus, the plurality of secondary nodes need not include all of the secondary nodes. Clearly, the claimed plurality of secondary nodes receiving an update is not analogous to the process of Gabber in which all of the storage nodes receiving a write request.

As noted in the Office Action, Gabber fails to show, teach or even suggest the claimed log. It is posited in the Office Action that Duprey cures this infirmity, and that the motivation for combining these references is that:

"Gabber and Duprey are related art solving similar problems such that they are both directed towards improvements in back-up system design through multiple remote mirrors/copies. It would have been obvious to a person of ordinary skill in the art at the same time the invention was made to implement the steps as taught by Duprey in the system of Gabber because keeping track of the updates and notifying each mirror of the status of the other mirrors provides an exceptionally robust fail-over system in comparison to Gabber alone." (Office Action p. 6-7)

This line of reasoning suffers from a number of infirmities. First, Duprey fails to cure the lack of certain claim elements from which Gabber suffers, more specifically Duprey does not cure Gabber's failure to teach identifying a plurality of secondary nodes. Although not Gabber not only fails in this regard, but Gabber's also fails to teach sending an *update,* and sending an update to *the plurality of secondary nodes*, (not ALL of the secondary nodes). These infirmities of Gabber remain unaddressed by Gabber as well as by the addition of Duprey. Unfortunately, the addition of Duprey fails to remedy this infirmity because, even if Duprey could be characterized as disclosing a logical unit associated with a storage processor, each storage processor maintaining a write log, as discussed in the sections below, Duprey fails to disclose sending data update to *the plurality of secondary nodes,* thus highlighting one of many incompatibilities between Gabber and Duprey.

The Office Action cites the following portion of Duprey:

"The SP software requires each LU to be owned and accessed through one and only one SP at a time. This notion of LU ownership is referred to as "assignment." The SP software allows each LU in a LU Array Set to be "assigned" to a different SP. During normal operation of the storage unit, both SPs process requests and perform various management functions in order to provide redundancy for the storage unit. If one SP fails, the other SP takes over management of the LUs for the failed SP." (Duprey col. 6 lines 35-43)

and

"FIG. 3 shows a conceptual view of the relevant components of a SP, such as the primary SP 204 and the secondary SP 208, for operation in the master storage unit 130. As shown in FIG. 3, the SP includes, among other things, remote mirroring logic 302, write cache 304, automatic backup/ restoral logic 306, and disk management logic 308." (Duprey col. 6 lines 62-67)

As teaching:

"...
at least one secondary node of the plurality of secondary nodes inserts the update in a respective log of updates, and each of the respective log of updates corresponds to a respective copy of the data,
..."

The Office Action asserts that the claimed log of update is analogous to Duprey's write log. More specifically, the Office Action alleges that secondary node inserting update in a respective log of updates to a respective copy of data is analogous to Duprey's two SP's maintaining a write log to protect against the failure. (Office Action p. 6)

Duprey's storage processors are not analogous to the plurality of secondary nodes of claim 1. In FIG. 2, Duprey only teaches *two* storage processors, the "primary" SP 204, which is primarily responsible for managing a particular mirror image, and the "secondary" SP 208. (Duprey col. 6 lines 53-62) Each SP maintains a write cache. (Duprey col. 7, lines 1-29)

The Office Action cites the following portion of Duprey as teaching the write log:

"...

The remote mirroring logic 302 maintains the write intent log in the write cache 304, which is a local high-speed memory on the SP that is replicated on the peer SP (i.e., the write cache 304 on the SP 204 is replicated on the SP 208, and the write cache 304 on the SP 208 is replicated on the SP 204). The automatic backup/restoral logic 306 automatically stores the write cache 304, including the write intent log, in the Disk Array 206 upon detecting a failure of the master storage unit 130 and restores the write cache 304 from the Disk Array 206 when the SP recovers from the failure

..." (Duprey col. 7, lines 11-23)

Claim 1 recites a secondary node inserting the update in a respective log of updates. Claim 1 requires that each updates log correspond to a copy of data. Thus claim 1 describes maintaining a separate update log for each update. Each data update is thus reflected in a separate log. The cited portions of Duprey teaches replicating a local high-speed memory on one SP on the other SP. Hence, Duprey teaches the two SP swapping the write cache. However, the cited portion of Duprey fails to recite anything that even comes close to maintaining a separate update log for each update limitation of claim 1.

Additionally, Duprey fails to teach "sending a notification to each of the plurality of secondary nodes *once* all of the pluralities of secondary nodes have acknowledged the update..." element of claim 1. As discussed before, Duprey teaches two storage processors, a primary SP and a secondary SP. Even if Duprey's storage processors were analogous to the claimed plurality of secondary nodes, (a point applicants do not concede) and even if Duprey's the storage processors did send a notification, (which Applicants are unable to locate in Duprey) since Duprey only describes *two* processors, the update must be sent to a singular storage processor. Thus, Duprey clearly fails to teach "sending a notification to each of the plurality of secondary nodes ..." element of claim 1.

Given that Duprey teaches sending an update to a singular storage processor, it comes as no surprise that only a singular processor would acknowledge an update or need to do so. Thus, acknowledgement must to be sent from the storage processor receiving the update to the storage processor sending the update. Clearly the acknowledgement can not be sent by the *plurality* of storage processors (secondary nodes).

Since Duprey fails to teach sending a notification to each of the plurality of secondary nodes, Duprey is oblivious to the fact that notification acknowledgement can be sent by the plurality of nodes. Obviously, Duprey is incapable of teaching the sending of a notification *once* all of the plurality of secondary nodes have acknowledged the update limitation of claim 1.

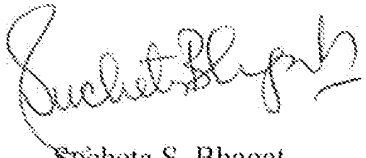
Applicants respectfully submit, therefore, that for at least reasons stated above, claims 1-22 are allowable over Gabber. Applicants respectfully urge the Examiner to withdraw the §103 rejection of claims 1-22.

CONCLUSION

Applicants submit that all claims are now in condition for allowance, and an early notice to that effect is solicited. Nonetheless, should any issues remain that might be subject to resolution through a telephonic interview, the Examiner is requested to telephone the undersigned.

If any extensions of time under 37 C.F.R. § 1.136(a) are required in order for this submission to be considered timely, Applicant hereby petitions for such extensions. Applicant also hereby authorizes that any fees due for such extensions or any other fee associated with this submission, as specified in 37 C.F.R. § 1.16 or § 1.17, be charged to Deposit Account 502306.

Respectfully submitted,



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